# Introduction to the Quantitative Analysis of Textual Data Using quanteda \*

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### 1 Introduction: The Rationale for quanteda

quanteda is an R package designed to simplify the process of quantitative analysis of text from start to finish, making it possible to turn texts into a structured corpus, conver this corpus into a quantitative matrix of features extracted from the texts, and to perform a variety of quantitative analyses on this matrix. The object is inference about the data contained in the texts, whether this means describing characteristics of the texts, inferring quantities of interests about the texts of their authors, or determining the tone or topics contained in the texts. The emphasis of quanteda is on *simplicity*: creating a corpus to manage texts and variables attached to these texts in a straightforward way, and providing powerful tools to extract features from this corpus that can be analyzed using quantitative techniques.

The tools for getting texts into a corpus object include:

- loading texts from directories of individual files
- loading texts "manually" by inserting them into a corpus using helper functions
- managing text encodings and conversions from source files into corpus texts
- attaching variables to each text that can be used for grouping, reorganizing a corpus, or simply recording additional information to supplement quantitative analyses with non-textual data
- recording meta-data about the sources and creation details for the corpus.

The tools for working with a corpus include:

- summarizing the corpus in terms of its language units
- reshaping the corpus into smaller units or more aggregated units
- adding to or extracting subsets of a corpus
- resampling texts of the corpus, for example for use in non-parametric bootstrapping of the texts (for an example, see Lowe and Benoit, 2013)

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• Easy extraction and saving, as a new data frame or corpus, key words in context (KWIC)

For extracting features from a corpus, quanteda provides the following tools:

- extraction of word types
- extraction of word *n*-grams
- extraction of dictionary entries from user-defined dictionaries
- feature selection through
  - stemming
  - random selection
  - document frequency
  - word frequency
  - and a variety of options for cleaning word types, such as capitalization and rules for handling punctuation.

For analyzing the resulting *document-feature* matrix created when features are abstracted from a corpus, quanteda provides:

- scaling models, such as the Poisson scaling model or Wordscores
- nonparametric visualization, such as correspondence analysis
- topic models, such as LDA
- classifiers, such as Naive Bayes or k-nearest neighbour
- · sentiment analysis, using dictionaries

quanteda is hardly unique in providing facilities for working with text – the excellent tm package already provides many of the features we have described. quanteda is designed to complement those packages, as well to simplify the implementation of the text-to-analysis workflow. quanteda corpus structures are simpler objects than in tm, as are the document-feature matrix objects from quanteda, compared to the sparse matrix implementation found in tm. However, there is no need to choose only one package, since we provide translator functions from one matrix or corpus object to the other in quanteda.

This vignette is designed to introduce you to quanteda as well as provide a tutorial overview of its features.

# 2 Installing quanteda

The code for the quanteda package currently resides on http://github/kbenoit/quanteda. From an Internet-connected computer, you can install the package directly using the devtools package:

```
library(devtools)
if (!require(quanteda)) install_github("quanteda", username = "kbenoit")
```

For other branches, for instance if you wish to install the dev branch (containing work in progress) rather than the master, you should instead run

```
install_github("quanteda", username = "kbenoit", ref = "dev")
```

## 3 Creating a corpus

#### 3.1 Loading Documents into Quanteda

#### From a directory of files

A very common source of files for creating a corpus will be a set of text files found on a local (or remote) directory. To load in a set of these files, we will load a corpus from a set of text files using information on attributes of the text that have been conveniently stored in the text document's filename (separated by underscores). For example, for our corpus of Irish budget speeches, the filename 2010\_BUDGET\_03\_Joan\_Burton\_LAB.txt tells us the year of the speech (2010), the type ("BUDGET"), a serial number (03), the first and last name of the speaker, and a party label ("LAB" for Labour).

To load this into a corpus object, we will use the corpusFromFilenames function, supplying a vector of attribute labels that correspond with the elements of the filename.

```
library(quanteda)
textfile <- "https://github.com/kbenoit/quanteda/blob/dev/texts/irishbudgets2010.zip"
download.file(textfile, basename(textfile), method = "curl") # download this zipped arch
# unzip(basename(textfile)) # unzip the file
attNames <- c("year", "debate", "number", "firstname", "surname", "party")
# ieBudgets2010 <- corpusFromFilenames(gsub('.zip', '', basename(amicusFile)),
# c('year', 'debate', 'no', 'fname', 'speaker', 'party'), sep='_')</pre>
```

This creates a new quanteda corpus object where each text has been associated values for its attribute types extracted from the filename:

```
data(iebudgets)
summary(iebudgets)
## Corpus object contains 196 texts.
##
##
                                          Texts Types Tokens Sentences year debate
##
          2012_BUDGET_01_Michael_Noonan_FG.txt
                                                 1538
                                                                    294 2012 BUDGET
                                                         6450
##
         2012_BUDGET_02_Michael_McGrath_FF.txt 1417
                                                         6098
                                                                    307 2012 BUDGET
##
          2012_BUDGET_03_Pearse_Doherty_SF.txt
                                                1607
                                                         6813
                                                                    378 2012 BUDGET
          2012_BUDGET_04_Mick_Wallace_Indp.txt
##
                                                   577
                                                        1531
                                                                     98 2012 BUDGET
##
       2012_BUDGET_05_Richard_Barrett_PBPA.txt
                                                  577
                                                        1820
                                                                     88 2012 BUDGET
##
            2012_BUDGET_06_Shane_Ross_Indp.txt
                                                  505
                                                        1575
                                                                     78 2012 BUDGET
##
              2012_BUDGET_07_Enda_Kenny_FG.txt
                                                 1092
                                                         4000
                                                                    183 2012 BUDGET
           2012_BUDGET_08_Pat_Rabbitte_LAB.txt
##
                                                 1015
                                                         3613
                                                                    199 2012 BUDGET
```

```
2012 BUDGET 09 Micheal Martin FF.txt
                                                                     258 2012 BUDGET
##
                                                  1355
                                                          5016
##
             2012 BUDGET 10 Gerry Adams SF.txt
                                                  1131
                                                          3510
                                                                     199 2012 BUDGET
            2012_BUDGET_11_Joe_Higgins_SOC.txt
##
                                                          1850
                                                    650
                                                                      66 2012 BUDGET
##
        2012_BUDGET_12_Finian_McGrath_Indp.txt
                                                                     119 2012 BUDGET
                                                    666
                                                          2111
##
          2012_BUDGET_13_Richard_Bruton_FG.txt
                                                   487
                                                          1414
                                                                      56 2012 BUDGET
##
           2012_BUDGET_14_Ruairi_Quinn_LAB.txt
                                                   462
                                                          1545
                                                                      54 2012 BUDGET
##
           2012_BUDGET_15_Ciaran_Cannon_FG.txt
                                                    584
                                                          1716
                                                                      73 2012 BUDGET
##
             2012_BUDGET_16_Willie_ODea_FF.txt
                                                   904
                                                          2798
                                                                     147 2012 BUDGET
##
             2012_BUDGET_17_Seamus_Kirk_FF.txt
                                                   517
                                                          1217
                                                                      56 2012 BUDGET
##
           2012 BUDGET 18 Simon Coveney FG.txt
                                                    651
                                                          2044
                                                                      86 2012 BUDGET
##
            2012_BUDGET_19_James_Reilly_FG.txt
                                                   708
                                                          2473
                                                                      97 2012 BUDGET
##
         2012 BUDGET 20 Jonathan OBrien SF.txt
                                                   464
                                                          1143
                                                                      58 2012 BUDGET
##
           2012_BUDGET_21_Brian_Stanley_SF.txt
                                                    517
                                                          1382
                                                                      72 2012 BUDGET
##
        2012 BUDGET 22 Michael Colreavy SF.txt
                                                   306
                                                           652
                                                                      30 2012 BUDGET
##
            2012_BUDGET_23_Dessie_Ellis_SF.txt
                                                   319
                                                           643
                                                                      27 2012 BUDGET
##
            2012 BUDGET 24 Alan Shatter FG.txt
                                                          4761
                                                                     187 2012 BUDGET
                                                  1244
##
     2012 BUDGET 25 Maureen OSullivan Indp.txt
                                                   526
                                                          1331
                                                                      65 2012 BUDGET
##
         2012_BUDGET_26_John_Halligan_Indp.txt
                                                           903
                                                                      46 2012 BUDGET
                                                   405
##
          2012_BUDGET_27_Seamus_Healy_WUAG.txt
                                                   324
                                                                      53 2012 BUDGET
                                                           801
##
        2012_BUDGET_28_Thomas_Pringle_Indp.txt
                                                   438
                                                           855
                                                                      46 2012 BUDGET
##
            2012_BUDGET_29_Leo_Varadkar_FG.txt
                                                   909
                                                          3341
                                                                     161 2012 BUDGET
##
             2012_BUDGET_30_Alan_Kelly_LAB.txt
                                                   515
                                                          1441
                                                                      68 2012 BUDGET
##
            2012_BUDGET_31_Michael_Ring_FG.txt
                                                   310
                                                          929
                                                                      61 2012 BUDGET
##
           2012_BUDGET_32_Dara_Calleary_FF.txt
                                                    685
                                                          2168
                                                                     107 2012 BUDGET
##
             2012_BUDGET_33_John_Browne_FF.txt
                                                    408
                                                          1168
                                                                      56 2012 BUDGET
##
            2012_BUDGET_34_Timmy_Dooley_FF.txt
                                                   430
                                                          1079
                                                                      53 2012 BUDGET
##
          2012 BUDGET 35 Jimmy Deenihan FG.txt
                                                          2247
                                                                     100 2012 BUDGET
                                                    646
##
             2012_BUDGET_36_Brian_Hayes_FG.txt
                                                   430
                                                          1199
                                                                      54 2012 BUDGET
           2012 BUDGET 37 Peadar Toibin SF.txt
                                                                      75 2012 BUDGET
##
                                                   537
                                                          1393
##
         2012 BUDGET 38 Sandra McLellan SF.txt
                                                   520
                                                          1373
                                                                      67 2012 BUDGET
    2012 BUDGET 39 Padraig MacLochlainn SF.txt
                                                   392
                                                           997
                                                                      51 2012 BUDGET
##
              2012 BUDGET 40 Sean Crowe SF.txt
                                                           563
##
                                                   274
                                                                      33 2012 BUDGET
##
      2012_BUDGET_41_Frances_Fitzgerald_FG.txt
                                                                     124 2012 BUDGET
                                                    633
                                                          2212
##
          2012_BUDGET_42_Jan_OSullivan_LAB.txt
                                                                      66 2012 BUDGET
                                                    550
                                                          1618
##
              2012_BUDGET_43_John_Perry_FG.txt
                                                   406
                                                          1016
                                                                      45 2012 BUDGET
##
         2012_BUDGET_44_John_McGuinness_FF.txt
                                                   498
                                                          1650
                                                                      98 2012 BUDGET
##
             2012_BUDGET_45_Eamon_OCuiv_FF.txt
                                                   703
                                                          2502
                                                                     123 2012 BUDGET
##
         2012_BUDGET_46_Olivia_Mitchell_FG.txt
                                                   388
                                                           886
                                                                      49 2012 BUDGET
##
          2012_BUDGET_47_Jerry_Buttimer_FG.txt
                                                           977
                                                   418
                                                                      50 2012 BUDGET
##
          2012_BUDGET_48_Bernard_Durkan_FG.txt
                                                   399
                                                          1213
                                                                      62 2012 BUDGET
##
               2012_BUDGET_49_Tom_Barry_FG.txt
                                                   436
                                                          1135
                                                                      70 2012 BUDGET
           2012 BUDGET 50 Tom Fleming Indp.txt
                                                                      56 2012 BUDGET
##
                                                   427
                                                          1036
##
        2012_BUDGET_51_Mattie_McGrath_Indp.txt
                                                   554
                                                          1472
                                                                     109 2012 BUDGET
         2012 BUDGET 52 Luke Flanagan Indp.txt
                                                          1697
                                                                      93 2012 BUDGET
##
                                                   558
##
       2012 BUDGET 53 Dominic Hannigan LAB.txt
                                                   335
                                                           887
                                                                      51 2012 BUDGET
##
          2012_BUDGET_54_Arthur_Spring_LAB.txt
                                                   291
                                                           641
                                                                      32 2012 BUDGET
           2011 BUDGET 01 Brian Lenihan FF.txt
                                                                     371 2011 BUDGET
##
                                                  1537
                                                          7094
```

```
2011 BUDGET 02 Michael Noonan FG.txt 1110
                                                                     227 2011 BUDGET
##
                                                         4275
##
            2011 BUDGET 03 Joan Burton LAB.txt
                                                  1262
                                                          4654
                                                                     254 2011 BUDGET
##
          2011_BUDGET_04_Pearse_Doherty_SF.txt
                                                  1337
                                                          5941
                                                                     326 2011 BUDGET
##
                                                                     334 2011 BUDGET
             2011_BUDGET_05_Brian_Cowen_FF.txt
                                                  1506
                                                          6870
##
              2011_BUDGET_06_Enda_Kenny_FG.txt
                                                  1154
                                                          4418
                                                                     204 2011 BUDGET
##
                                                                     218 2011 BUDGET
          2011_BUDGET_07_Eamon_Gilmore_LAB.txt
                                                  1172
                                                          4613
##
         2011_BUDGET_08_Brendan_Howlin_LAB.txt
                                                   463
                                                          1163
                                                                      53 2011 BUDGET
##
         2011_BUDGET_09_John_Gormley_Green.txt
                                                          3755
                                                                     181 2011 BUDGET
                                                  1022
##
     2011_BUDGET_10_Caoimhghin_OCaolain_SF.txt
                                                  1438
                                                          5282
                                                                     282 2011 BUDGET
##
           2011 BUDGET 11 Eamon Ryan Green.txt
                                                          1629
                                                   513
                                                                      67 2011 BUDGET
##
          2011_BUDGET_12_Micheal_Martin_FF.txt
                                                   553
                                                          1607
                                                                      73 2011 BUDGET
##
        2011 BUDGET 13 Michael Finneran FF.txt
                                                   442
                                                          1108
                                                                      48 2011 BUDGET
##
            2011_BUDGET_14_James_Reilly_FG.txt
                                                   420
                                                          1021
                                                                      65 2011 BUDGET
            2011 BUDGET 15 Fergus ODowd FG.txt
                                                                      72 2011 BUDGET
##
                                                   454
                                                          1128
##
         2011_BUDGET_16_Catherine_Byrne_FG.txt
                                                   461
                                                          1173
                                                                      62 2011 BUDGET
          2011 BUDGET 17 Bernard Durkan FG.txt
                                                          895
                                                                      44 2011 BUDGET
##
                                                   365
##
           2011 BUDGET 18 Brendan Smith FF.txt
                                                   723
                                                          2368
                                                                     103 2011 BUDGET
##
                                                           563
                                                                      26 2011 BUDGET
            2011_BUDGET_19_Johnny_Brady_FF.txt
                                                   268
                                                                      67 2011 BUDGET
            2011_BUDGET_20_Batt_OKeeffe_FF.txt
##
                                                   485
                                                          1357
##
            2011_BUDGET_21_Michael_Ring_FG.txt
                                                   269
                                                           632
                                                                      40 2011 BUDGET
##
                                                         1009
                                                                      48 2011 BUDGET
           2011_BUDGET_22_Simon_Coveney_FG.txt
                                                   381
##
           2011_BUDGET_23_Deirdre_Clune_FG.txt
                                                   274
                                                           596
                                                                      28 2011 BUDGET
##
              2011_BUDGET_24_Phil_Hogan_FG.txt
                                                                      21 2011 BUDGET
                                                   280
                                                           602
##
          2011_BUDGET_25_Jimmy_Deenihan_FG.txt
                                                   310
                                                           676
                                                                      40 2011 BUDGET
##
            2011_BUDGET_26_Sean_Barrett_FG.txt
                                                   337
                                                          745
                                                                      49 2011 BUDGET
##
               2011_BUDGET_27_Pat_Carey_FF.txt
                                                   438
                                                          1279
                                                                      59 2011 BUDGET
                                                                      59 2011 BUDGET
##
           2011_BUDGET_28_Mary_White_Green.txt
                                                   526
                                                          1426
##
         2011_BUDGET_29_Martin_Mansergh_FF.txt
                                                   438
                                                          1013
                                                                      36 2011 BUDGET
           2011 BUDGET 30 Pat Rabbitte LAB.txt
                                                         1514
                                                                      64 2011 BUDGET
##
                                                   534
##
        2011 BUDGET 31 Michael Higgins LAB.txt
                                                   546
                                                         1341
                                                                      62 2011 BUDGET
##
         2011 BUDGET 32 Kathleen Lynch LAB.txt
                                                   277
                                                                      46 2011 BUDGET
                                                          715
##
            2011 BUDGET 33 Mary Hanafin FF.txt
                                                   471
                                                          1335
                                                                      63 2011 BUDGET
##
          2011_BUDGET_34_Billy_Kelleher_FF.txt
                                                   461
                                                          1332
                                                                      59 2011 BUDGET
        2011_BUDGET_35_Finian_McGrath_Indp.txt
                                                                      36 2011 BUDGET
##
                                                   296
                                                          714
##
     2011_BUDGET_36_Maureen_OSullivan_Indp.txt
                                                   292
                                                           618
                                                                      21 2011 BUDGET
##
                                                           490
                                                                      25 2011 BUDGET
        2011_BUDGET_37_Mattie_McGrath_Indp.txt
                                                   216
##
           2010_BUDGET_01_Brian_Lenihan_FF.txt
                                                  1655
                                                          7799
                                                                     390 2010 BUDGET
##
          2010_BUDGET_02_Richard_Bruton_FG.txt
                                                   956
                                                          4058
                                                                     222 2010 BUDGET
##
            2010_BUDGET_03_Joan_Burton_LAB.txt
                                                  1485
                                                          5770
                                                                     329 2010 BUDGET
##
           2010_BUDGET_04_Arthur_Morgan_SF.txt
                                                                     349 2010 BUDGET
                                                  1463
                                                          6481
##
             2010_BUDGET_05_Brian_Cowen_FF.txt
                                                  1473
                                                          5880
                                                                     262 2010 BUDGET
              2010 BUDGET 06_Enda_Kenny_FG.txt
##
                                                  1066
                                                          3875
                                                                     161 2010 BUDGET
##
         2010_BUDGET_07_Kieran_ODonnell_FG.txt
                                                          2066
                                                                     141 2010 BUDGET
                                                   614
          2010 BUDGET 08 Eamon Gilmore LAB.txt
                                                                     208 2010 BUDGET
##
                                                  1098
                                                          3800
##
        2010_BUDGET_09_Michael_Higgins_LAB.txt
                                                   447
                                                          1136
                                                                      49 2010 BUDGET
                        speaker party
##
            fname
    no
##
    01
          Michael
                         Noonan
```

| ## | 02  | Michael  | McGrath      | FF   |
|----|-----|----------|--------------|------|
| ## | 03  | Pearse   | Doherty      | SF   |
| ## | 04  | Mick     | Wallace      | Indp |
| ## | 05  | Richard  | Barrett      | PBPA |
| ## | 06  | Shane    | Ross         | Indp |
| ## |     |          |              |      |
|    | 07  | Enda     | Kenny        | FG   |
| ## | 0.8 | Pat      | Rabbitte     | LAB  |
| ## | 09  | Micheal  | Martin       | FF   |
| ## | 10  | Gerry    | Adams        | SF   |
| ## | 11  | Joe      | Higgins      | SOC  |
| ## | 12  | Finian   | McGrath      | Indp |
| ## | 13  | Richard  | Bruton       | FG   |
| ## | 14  | Ruairi   | Quinn        | LAB  |
| ## | 15  | Ciaran   | Cannon       | FG   |
| ## | 16  | Willie   | ODea         | FF   |
| ## | 17  | Seamus   | Kirk         | FF   |
| ## | 18  | Simon    | Coveney      | FG   |
| ## | 19  | James    | Reilly       | FG   |
| ## | 20  | Jonathan | OBrien       | SF   |
| ## | 21  | Brian    | Stanley      | SF   |
| ## | 22  | Michael  | Colreavy     | SF   |
| ## |     |          | _            | SF   |
|    | 23  | Dessie   | Ellis        |      |
| ## | 24  | Alan     | Shatter      | FG   |
| ## | 25  | Maureen  |              | _    |
| ## | 26  | John     | Halligan     | Indp |
| ## | 27  | Seamus   | Healy        | WUAG |
| ## | 28  | Thomas   | Pringle      | Indp |
| ## | 29  | Leo      | Varadkar     | FG   |
| ## | 30  | Alan     | Kelly        | LAB  |
| ## | 31  | Michael  | Ring         | FG   |
| ## | 32  | Dara     | Calleary     | FF   |
| ## | 33  | John     | Browne       | FF   |
| ## | 34  | Timmy    | Dooley       | FF   |
| ## | 35  | Jimmy    | Deenihan     | FG   |
| ## | 36  | Brian    |              | FG   |
| ## | 37  | Peadar   | Toibin       | SF   |
| ## | 38  | Sandra   | McLellan     | SF   |
|    |     |          | MacLochlainn |      |
| ## | 39  | _        |              | SF   |
| ## | 40  | Sean     | Crowe        | SF   |
| ## | 41  | Frances  | -            | FG   |
| ## | 42  | Jan      | OSullivan    | LAB  |
| ## | 43  | John     | Perry        | FG   |
| ## | 44  | John     |              | FF   |
| ## | 45  | Eamon    | OCuiv        | FF   |
| ## | 46  | Olivia   | Mitchell     | FG   |
| ## | 47  | Jerry    | Buttimer     | FG   |
| ## | 48  | Bernard  | Durkan       | FG   |
|    |     |          |              |      |

| ## 50 Tom Fleming Ind ## 51 Mattie McGrath Ind ## 52 Luke Flanagan Ind ## 53 Dominic Hannigan La ## 54 Arthur Spring La ## 01 Brian Lenihan Ind ## 02 Michael Noonan Burton La ## 04 Pearse Doherty Ind ## 05 Brian Cowen Ind ## 07 Eamon Gilmore La ## 08 Brendan Howlin La ## 09 John Gormley Gree ## 10 Caoimhghin OCaolain Ind ## 11 Eamon Ryan Gree ## 12 Michael Martin Ind ## 13 Michael Finneran Ind ## 14 James Reilly Ind ## 15 Fergus ODowd Ind ## 16 Catherine Byrne Ind ## 17 Bernard Durkan Ind ## 18 Brendan Smith Ind ## 19 Johnny Brady Ind ## 20 Batt OKeeffe Ind ## 21 Michael Ring Ind ## 22 Simon Coveney Ind ## 23 Deirdre Clune Ind ## 24 Phil Hogan Ind ## 25 Jimmy Deenihan Ind ## 26 Sean Barrett Ind ## 29 Martin Mansergh Ind ## 30 Pat Rabbitte La ## 31 Michael Higgins La ## 32 Kathleen Lynch La ## 33 Mary Hanafin Ind ## 34 Billy Kelleher Ind ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 37 Mattie McGrath Ind ## 37 Mattie McGrath Ind ## 38 Mary Hanafin Ind ## 39 Joan Burton La ## 31 Michael Bruton Ind ## 32 Richard Bruton Ind ## 34 Billy Kelleher Ind ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 38 Mary Hanafin Ind ## 39 Joan Burton Ind ## 30 Pat Rabbitte La ## 31 Michael Bruton Ind ## 32 Richard Bruton Ind ## 34 Billy Kelleher Ind ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 38 Mary Hanafin Ind ## 39 Joan Burton Ind ## 30 Pat Rabbitte Ind ## 31 Michael Bruton Ind ## 32 Richard Bruton Ind ## 34 Billy Kelleher Ind ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 38 Mary Hanafin Ind ## 39 Joan Burton Ind ## 30 Mattie McGrath Ind ## 31 Michael Bruton Ind ## 32 Richard Bruton Ind ## 34 Billy Kelleher Ind ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 38 Mary Hanafin Ind ## 39 Joan Burton Ind ## 30 Mattie McGrath Ind ## 31 Michael Bruton Ind ## 31 Michael Bruton Ind ## 32 Richard Bruton Ind ## 34 Billy Kelleher Ind ## 35 Finian McGrath Ind ## 36 May Bru | 11 11 | 4.0 | _         | _        |      |
|--|-------|-----|-----------|----------|------|
| ## 51 Mattie   | ##    | 49  | Tom       | Barry    | FG   |
| ## 52  |       |     |           |          | Indp |
| ## 53 Dominic Hannigan La   ## 54 Arthur Spring La   ## 01 Brian Lenihan   ## 02 Michael Noonan   ## 03 Joan Burton La   ## 04 Pearse Doherty   ## 05 Brian Cowen   ## 07 Eamon Gilmore La   ## 08 Brendan Howlin La   ## 10 Caoimhghin OCaolain   ## 11 Eamon Ryan Gree   ## 12 Michael Martin   ## 13 Michael Finneran   ## 14 James Reilly   ## 15 Fergus ODowd   ## 16 Catherine Byrne   ## 17 Bernard Durkan   ## 18 Brendan Smith   ## 19 Johnny Brady   ## 20 Batt OKeeffe   ## 21 Michael Ring   ## 22 Simon Coveney   ## 23 Deirdre Clune   ## 24 Phil Hogan   ## 25 Jimmy Deenihan   ## 26 Sean Barrett   ## 27 Pat Carey   ## 28 Mary White Gree   ## 29 Martin Mansergh   ## 30 Pat Rabbitte   ## 31 Michael Higgins   ## 32 Kathleen Lynch La   ## 33 Mary Hanafin   ## 34 Billy Kelleher   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 02 Richard Bruton   ## 03 Joan Burton   ## 04 Pearse   Doherty   ## 05   ## 06   Enda Kenny   ## 06   Enda Kenny   ## 07   Eamon   Gilmore   ## 26   ## 27   Pat    Carey   ## 28   ## 29   ## 29   ## 30   ## 31   ## 32   ## 34   ## 31   ## 35   ## 36   ## 37   ## 36   ## 37   ## 38   ## 39   ## 30   ## 30   ## 31   ## 34   ## 35   ## 36   ## 37   ## 38   ## 39   ## 30   ## 30   ## 30   ## 31   ## 32   ## 33   ## 34   ## 35   ## 36   ## 37   ## 38   ## 39   ## 30   ## 30   ## 30   ## 30   ## 31   ## 32   ## 33   ## 34   ## 34   ## 35   ## 36   ## 37   ## 38   ## 39   ## 30   ## 30   ## 30   ## 30   ## 31   ## 32   ## 33   ## 34   ## 34   ## 35   ## 36   ## 37   ## 38   ## 39   ## 30   ## 30   ## 30   ## 30   ## 30   ## 30   ## 31   ## 31   ## 32   ## 33   ## 34   ## 34   ## 35   ## 36   ## 37   ## 38   ## 39   ## 30   ## |       |     |           |          | Indp |
| ## 54 Arthur Spring Lenihan ## 01 Brian Lenihan ## 02 Michael Noonan ## 03 Joan Burton Lenihan ## 04 Pearse Doherty ## 05 Brian Cowen ## 06 Enda Kenny ## 07 Eamon Gilmore Lenihan ## 09 John Gormley Gree ## 10 Caoimhghin OCaolain ## 11 Eamon Ryan Gree ## 12 Michael Martin ## 13 Michael Finneran ## 14 James Reilly ## 15 Fergus ODowd ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 19 Johnny Brady ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Gree ## 29 Martin Mansergh ## 30 Pat Rabbitte Lenihan ## 31 Michael Higgins Lenihan ## 32 Kathleen Lynch Lenihan ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen ## 37 Mattie McGrath Ind ## 37 Mattie McGrath Ind ## 38 Deirdard Bruton ## 39 Deirdard Bruton ## 30 Deirdard Bruton ## 31 Michael Bruton ## 32 Richard Bruton ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen ## 37 Mattie McGrath Ind ## 38 Mary Hanafin ## 39 Martin McGrath Ind ## 30 Mattie McGrath Ind ## 31 Michael Bruton ## 32 Richard Bruton ## 33 Mary ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen ## 37 Mattie McGrath Ind ## 38 Mary Hanafin ## 39 Mattie McGrath Ind ## 30 Mattie McGrath Ind ## 31 Michael Bruton ## 32 Richard Bruton ## 33 Mary ## 34 Billy Richard Bruton ## 35 Mattie McGrath Ind ## 36 Maureen ## 37 Mattie McGrath Ind ## 38 Mary ## 39 Mattie McGrath Ind ## 30 Mattie McGrath Ind ## 31 Michael Bruton ## 32 Richard Bruton ## 33 Mary ## 34 Mattie McGrath Ind ## 35 Mattie McGrath Ind ## 36 Maureen ## 37 Mattie McGrath Ind ## 38 Mattie McGrath Ind ## 39 Mattie McGrath Ind ## 30 Mattie McGrath Ind ## 30 Mattie McGrath Ind ## 31 Michael Bruton ## 31 Michael Bruton ## 32 Richard Bruton ## 33 Maty  |       | 52  | Luke      | Flanagan | Indp |
| ## 01 Brian Lenihan ## 02 Michael Noonan ## 03 Joan Burton Life ## 04 Pearse Doherty ## 05 Brian Cowen ## 06 Enda Kenny ## 07 Eamon Gilmore Life ## 08 Brendan Howlin Life ## 10 Caoimhghin OCaolain ## 11 Eamon Ryan Gree ## 12 Michael Martin ## 13 Michael Finneran ## 14 James Reilly ## 15 Fergus ODowd ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 19 Johnny Brady ## 19 Johnny Brady ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Gree ## 29 Martin Mansergh ## 30 Pat Rabbitte Life ## 31 Michael Higgins Life ## 32 Kathleen Lynch Life ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 37 Mattie McGrath Ind ## 37 Mattie McGrath Ind ## 02 Richard Bruton Life ## 03 Joan Burton Life   | ##    | 53  | Dominic   | Hannigan | LAB  |
| ## 02 Michael Noonan Burton Li   ## 03 Joan Burton Li   ## 04 Pearse Doherty   ## 05 Brian Cowen   ## 07 Eamon Gilmore Li   ## 08 Brendan Howlin Li   ## 10 Caoimhghin OCaolain   ## 11 Eamon Ryan Gree   ## 12 Michael Martin   ## 13 Michael Finneran   ## 15 Fergus ODowd   ## 16 Catherine Byrne   ## 17 Bernard Durkan   ## 18 Brendan Smith   ## 19 Johnny Brady   ## 20 Batt OKeeffe   ## 21 Michael Ring   ## 22 Simon Coveney   ## 23 Deirdre Clune   ## 24 Phil Hogan   ## 25 Jimmy Deenihan   ## 26 Sean Barrett   ## 27 Pat Carey   ## 28 Mary White Gree   ## 29 Martin Mansergh   ## 30 Pat Rabbitte Li   ## 31 Michael Higgins Li   ## 32 Kathleen Lynch Li   ## 33 Mary Hanafin   ## 34 Billy Kelleher   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 37 Mattie McGrath Ind   ## 02 Richard Bruton   ## 03 Joan Burton Li   ## 03 Joan Burton Li   ## 03 Joan Burton Li   ## 04 Phila Hogan   ## 05 Deirdre   ## 29 Martin Mansergh   ## 30 Pat Rabbitte Li   ## 31 Michael Higgins Li   ## 32 Kathleen Lynch Li   ## 33 Mary Hanafin   ## 34 Billy Kelleher   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 38 Mary Hanafin   ## 39 Mattie McGrath Ind   ## 30 Mattie McGrath Ind   ## 31 Michael Bruton   ## 32 Kathleen   ## 33 Mary Hanafin   ## 34 Billy Kelleher   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 38 Mary Hanafin   ## 39 Mattie McGrath Ind   ## 30 Mattie McGrath Ind   ## 31 Michael Bruton   ## 31 Michael Bruton   ## 32 Mattie McGrath Ind   ## 34 Mattie McGrath Ind   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 38 Mattie McGrath Ind   ## 39 Mattie McGrath Ind   ## 30 Mattie McGrath Ind   ## 30 Mattie McGrath Ind   ## 31 Michael McGrath Ind   ## 32 Mattie McGrath Ind   ## 34 Mattie McGrath Ind   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 38 Mattie McGrath Ind   ## 39 Mattie McGrath Ind   ## 30 Mattie McGrath Ind   ## 30 Mattie McGrath Ind | ##    | 54  | Arthur    | Spring   | LAB  |
| ## 03  | ##    | 01  | Brian     | Lenihan  | FF   |
| ## 03  | ##    | 02  | Michael   | Noonan   | FG   |
| ## 04 Pearse Doherty ## 05 Brian Cowen ## 06 Enda Kenny ## 07 Eamon Gilmore Li   | ##    | 03  | Joan      | Burton   | LAB  |
| ## 05 Brian Cowen ## 06 Enda Kenny ## 07 Eamon Gilmore Li  |       |     |           |          | SF   |
| ## 06 Enda Kenny H# 07 Eamon Gilmore Limits   ## 08 Brendan Howlin Limits   ## 09 John Gormley Gree   ## 10 Caoimhghin OCaolain   ## 11 Eamon Ryan Gree   ## 12 Micheal Martin   ## 13 Michael Finneran   ## 14 James Reilly   ## 15 Fergus ODowd   ## 16 Catherine Byrne   ## 17 Bernard Durkan   ## 18 Brendan Smith   ## 19 Johnny Brady   ## 20 Batt OKeeffe   ## 21 Michael Ring   ## 22 Simon Coveney   ## 23 Deirdre Clune   ## 24 Phil Hogan   ## 25 Jimmy Deenihan   ## 26 Sean Barrett   ## 27 Pat Carey   ## 28 Mary White Gree   ## 29 Martin Mansergh   ## 30 Pat Rabbitte Limits   ## 31 Michael Higgins Limits   ## 32 Kathleen Lynch Limits   ## 33 Mary Hanafin   ## 34 Billy Kelleher   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 38 Brian Lenihan   ## 39 Lenihan   ## 30 Brian Lenihan   ## 31 Michael Bruton   ## 37 Mattie McGrath Ind   ## 38 Mary Hanafin   ## 39 Martin McGrath Ind   ## 30 Mattie McGrath Ind   ## 31 Michael Bruton   ## 32 Richard Bruton   ## 31 Michael Bruton   ## 32 Richard Bruton   ## 33 Mary   ## 34 Billy Kelleher   ## 35 Finian McGrath Ind   ## 36 Maureen OSullivan Ind   ## 37 Mattie McGrath Ind   ## 38 Mary   ## 39 Mattie McGrath Ind   ## 30 Brian Lenihan   ## 31 Michael Bruton   ## 32 Richard Bruton   ## 34 Billy   ## 35 Finian Bruton   ## 36 Maureen   ## 37 Mattie   ## 38 Mary   ## 39 Mattie   ## 39 Mattie   ## 30 Mattie   ## 31 Michael   ## 31 Michael   ## 32 Richard   ## 33 Mary   ## 34 Billy   ## 35 Finian   ## 36 Maureen   ## 37 Mattie   ## 38 Mary   ## 39 Mattie   ## 39 Mattie   ## 30 Mattie   ## 31 Michael   ## 31 Michael   ## 32 Richard   ## 34 Billy   ## 35 Finian   ## 36 Maureen   ## 37 Mattie   ## 38 Mary   ## 39 Mattie   ## 39 Mattie   ## 30 Mattie   ## 30 Mattie   ## 31 Michael   ## 31 Michael   ## 32 Mattie   ## 33 Mattie   ## 34 Mattie   ## 35 Finian   ## 36 Mattie   ## 37 Mattie   ## 38 Mattie   ## 38 Mattie   ## 39 Mattie   ## 39 Mattie    |       |     |           | _        | FF   |
| ## 07 Eamon  |       |     |           |          | FG   |
| ## 08 Brendan Howlin Limits and the second s |       |     |           |          | LAB  |
| ## 09 John Gormley Green   ## 10 Caoimhghin  OCaolain   ## 11 Eamon  Ryan Green   ## 12 Micheal  Martin  |       |     |           |          | LAB  |
| ## 10 Caoimhghin   |       |     |           |          |      |
| ## 11 Eamon Ryan Green ## 12 Micheal Martin ## 13 Michael Finneran ## 14 James Reilly ## 15 Fergus ODowd ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 19 Johnny Brady ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Green ## 30 Pat Rabbitte Li ## 31 Michael Higgins Li ## 32 Kathleen Lynch Li ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Inc ## 36 Maureen OSullivan Inc ## 37 Mattie McGrath Inc ## 38 Brian Lenihan ## 02 Richard Bruton ## 03 Joan Burton Li ## 01 Brian Lenihan ## 02 Richard ## 03 Burton Li ## 03 Burton Li ## 03 Burton Li ## 04 Bruton ## 05 Bruton ## 06 Bruton ## 07 Bruton ## 08 Bruton ## 08 Bruton ## 09 Burton ## 09 Bruton  |       |     |           |          |      |
| ## 12 Micheal Martin ## 13 Michael Finneran ## 14 James Reilly ## 15 Fergus ODowd ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Gree ## 30 Pat Rabbitte Li ## 31 Michael Higgins Li ## 32 Kathleen Lynch Li ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 37 Mattie McGrath Ind ## 01 Brian Lenihan ## 02 Richard Bruton ## 03 Joan Burton Li ## 03 Burton Li ## 01 Brian Lenihan ## 02 Richard ## 03 Burton Li ## 03 Burton Li ## 03 Burton Li ## 04 Bruton ## 05 Bruton ## 06 Bruton ## 07 Brian Lenihan ## 08 Burton Li ## 08 Burton Li ## 08 Burton Li ## 09 Burton Li |       |     |           |          | SF   |
| ## 13 Michael Finneran ## 14 James Reilly ## 15 Fergus ODowd ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 19 Johnny Brady ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 25 Jimmy Deenihan ## 27 Pat Carey ## 28 Mary White Gree ## 29 Martin Mansergh ## 30 Pat Rabbitte Life ## 31 Michael Higgins Life ## 32 Kathleen Lynch Life ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Incomplete ## 36 Maureen OSullivan Incomplete ## 37 Mattie McGrath Incomplete ## 38 Mary Hanafin ## 39 Mary Hanafin Higher ## 30 Maureen OSullivan Incomplete ## 37 Mattie McGrath Incomplete ## 38 Mary Hanafin Higher ## 39 Mattie McGrath Incomplete ## 30 Maureen OSullivan Incomplete ## 31 Michael Higher ## 32 Mattie McGrath Incomplete ## 35 Finian McGrath Incomplete ## 36 Maureen OSullivan Incomplete ## 37 Mattie McGrath Incomplete ## 37 Mattie McGrath Incomplete ## 38 Mary Hanafin Higher Hi |       |     |           |          |      |
| ## 14 James Reilly ## 15 Fergus ODowd ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 19 Johnny Brady ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Gree ## 29 Martin Mansergh ## 30 Pat Rabbitte Life ## 31 Michael Higgins Life ## 32 Kathleen Lynch Life ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Incomplete ## 36 Maureen OSullivan Incomplete ## 37 Mattie McGrath Incomplete ## 38 Mary Hanafin ## 39 Mary Hanafin Higher Hanafin Higher Hanafin Higher Hanafin Higher Hanafin H |       |     |           |          | FF   |
| ## 15 Fergus ODowd ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 19 Johnny Brady ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Gree ## 30 Pat Rabbitte Li ## 31 Michael Higgins Li ## 32 Kathleen Lynch Li ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 38 Brian Lenihan ## 01 Brian Lenihan ## 02 Richard Bruton ## 03 Joan Burton Li ## 03 Burton Li ## 03 Burton Li ## 04 Bruton ## 05 Bruton ## 06 Bruton ## 07 Brian Lenihan ## 08 Bruton  |       | 13  | Michael   | Finneran | FF   |
| ## 16 Catherine Byrne ## 17 Bernard Durkan ## 18 Brendan Smith ## 19 Johnny Brady ## 20 Batt OKeeffe ## 21 Michael Ring ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Gree ## 29 Martin Mansergh ## 30 Pat Rabbitte Life ## 31 Michael Higgins Life ## 32 Kathleen Lynch Life ## 34 Billy Kelleher ## 35 Finian McGrath Incomplete ## 36 Maureen OSullivan Incomplete ## 37 Mattie McGrath Incomplete ## 38 Mary Hanafin ## 39 Martin McGrath Incomplete ## 30 Maureen OSullivan Incomplete ## 31 Mattie McGrath Incomplete ## 32 Mattie McGrath Incomplete ## 34 Maureen OSullivan Incomplete ## 35 Mattie McGrath Incomplete ## 36 Maureen OSullivan Incomplete ## 37 Mattie McGrath Incomplete ## 38 Mary Hanafin Incomplete ## 39 Mattie McGrath Incomplete ## 39 Mattie McGrath Incomplete ## 30 Mattie McGrath Incomplete ## 31 Mattie McGrath Incomplete ## 32 Mattie McGrath Incomplete ## 33 Mattie McGrath Incomplete ## 34 Mattie McGrath Incomplete ## 35 Mattie McGrath Incomplete ## 37 Mattie McGrath Incomplete ## 38 Mattie McGrath Incomplete ## 39 Mattie McGrath Incomplete ## 30 Mattie McGrath Incomplete ## 31 Mattie McGrath Incomplete ## 31 Mattie McGrath Incomplete McGrath Incomplete ## 31 Mattie McGrath Incomplete McGrath Incomple | ##    | 14  | James     | Reilly   | FG   |
| ## 17 Bernard Durkan   | ##    | 15  | Fergus    | ODowd    | FG   |
| ## 18 Brendan Smith  | ##    | 16  | Catherine | Byrne    | FG   |
| ## 19  | ##    | 17  | Bernard   | Durkan   | FG   |
| ## 20 Batt OKeeffe   | ##    | 18  | Brendan   | Smith    | FF   |
| ## 20 Batt OKeeffe   | ##    | 19  | Johnny    | Brady    | FF   |
| ## 21 Michael Ring 1   |       |     |           |          | FF   |
| ## 22 Simon Coveney ## 23 Deirdre Clune ## 24 Phil Hogan ## 25 Jimmy Deenihan ## 26 Sean Barrett ## 27 Pat Carey ## 28 Mary White Gree ## 30 Pat Rabbitte Life ## 31 Michael Higgins Life ## 32 Kathleen Lynch Life ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Inc ## 36 Maureen OSullivan Inc ## 37 Mattie McGrath Inc ## 38 Billy Religher ## 39 Mary Hanafin Inc ## 30 Maureen OSullivan Inc ## 31 Mattie McGrath Inc ## 32 Richard Bruton Inc ## 33 Mary Hanafin Higher ## 35 Finian McGrath Inc ## 36 Maureen OSullivan Inc ## 37 Mattie McGrath Inc ## 37 Mattie McGrath Inc ## 37 Mattie McGrath Inc ## 38 Bruton Inc ## 39 Bruton Inc ## 39 Bruton Inc ## 39 Bruton Inc ## 30 Bruton Inc ## 31 Bruton Inc ## 31 Bruton Inc ## 32 Bruton Inc ## 33 Bruton Inc ## 34 Bruton Inc ## 35 Bruton Inc ## 35 Bruton Inc ## 36 Bruton Inc ## 37 Mattie Bruton Inc ## 38 Bruton Inc ## 39 Bruton Inc ## 39 Bruton Inc ## 39 Bruton Inc ## 31 Bruton Inc ## 31 Bruton Inc ## 31 Bruton Inc ## 32 Bruton Inc ## 33 Bruton Inc ## 34 Bruton Inc ## 35 Bruton Inc ## 35 Bruton Inc ## 36 Bruton Inc ## 37 Bruton Inc ## 38 Bruton Inc ## 39 Bruton Inc ## 39 Bruton Inc ## 39 Bruton Inc ## 39 Bruton Inc ## 30 Bruton In |       |     |           |          | FG   |
| ## 23  |       |     |           | _        | FG   |
| ## 24 Phil Hogan Phil ## 25 Jimmy Deenihan Phil ## 26 Sean Barrett Phil Carey Pat Carey Phil Phil Phil Phil Phil Phil Phil Phil  |       |     |           | _        | FG   |
| ## 25  |       |     |           |          | FG   |
| ## 26 Sean Barrett Definition  |       |     |           | _        | FG   |
| ## 27  |       |     | _         |          |      |
| ## 28 Mary White Gree ## 29 Martin Mansergh II ## 30 Pat Rabbitte II ## 31 Michael Higgins II ## 32 Kathleen Lynch II ## 34 Billy Kelleher II ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 01 Brian Lenihan ## 02 Richard Bruton II ## 03 Joan Burton III  |       |     |           |          | FG   |
| ## 29 Martin Mansergh II ## 30 Pat Rabbitte II ## 31 Michael Higgins II ## 32 Kathleen Lynch II ## 33 Mary Hanafin II ## 34 Billy Kelleher II ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 01 Brian Lenihan II ## 02 Richard Bruton II ## 03 Joan Burton III   |       |     |           | _        | FF   |
| ## 30 Pat Rabbitte Li ## 31 Michael Higgins Li ## 32 Kathleen Lynch Li ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 01 Brian Lenihan ## 02 Richard Bruton ## 03 Joan Burton Li   |       |     | _         |          |      |
| ## 31 Michael Higgins Li ## 32 Kathleen Lynch Li ## 33 Mary Hanafin ## 34 Billy Kelleher ## 35 Finian McGrath Ind ## 36 Maureen OSullivan Ind ## 37 Mattie McGrath Ind ## 01 Brian Lenihan ## 02 Richard Bruton ## 03 Joan Burton Li   |       |     |           |          | FF   |
| ## 32 Kathleen Lynch Line ## 33 Mary Hanafin II ## 34 Billy Kelleher II ## 35 Finian McGrath Inc ## 36 Maureen OSullivan Inc ## 37 Mattie McGrath Inc ## 01 Brian Lenihan II ## 02 Richard Bruton II ## 03 Joan Burton II  |       |     |           |          | LAB  |
| ## 33 Mary Hanafin II ## 34 Billy Kelleher II ## 35 Finian McGrath Inc ## 36 Maureen OSullivan Inc ## 37 Mattie McGrath Inc ## 01 Brian Lenihan II ## 02 Richard Bruton II ## 03 Joan Burton II  |       |     |           |          | LAB  |
| ## 34 Billy Kelleher 19 ## 35 Finian McGrath Inc ## 36 Maureen OSullivan Inc ## 37 Mattie McGrath Inc ## 01 Brian Lenihan 19 ## 02 Richard Bruton 19 ## 03 Joan Burton 19 ## 10 Burton 19 ## 1 | ##    | 32  | Kathleen  | _        | LAB  |
| ## 35 Finian McGrath Inc<br>## 36 Maureen OSullivan Inc<br>## 37 Mattie McGrath Inc<br>## 01 Brian Lenihan Inc<br>## 02 Richard Bruton Inc<br>## 03 Joan Burton Inc  | ##    | 33  | Mary      | Hanafin  | FF   |
| ## 35 Finian McGrath Inc<br>## 36 Maureen OSullivan Inc<br>## 37 Mattie McGrath Inc<br>## 01 Brian Lenihan Inc<br>## 02 Richard Bruton Inc<br>## 03 Joan Burton Inc  | ##    | 34  | Billy     | Kelleher | FF   |
| ## 36 Maureen OSullivan Inc<br>## 37 Mattie McGrath Inc<br>## 01 Brian Lenihan Inc<br>## 02 Richard Bruton Inc<br>## 03 Joan Burton Inc  |       | 35  |           | McGrath  | Indp |
| ## 37 Mattie McGrath Inc<br>## 01 Brian Lenihan I<br>## 02 Richard Bruton I<br>## 03 Joan Burton I   |       |     |           |          | Indp |
| ## 01 Brian Lenihan 1  |       |     |           |          | Indp |
| ## 02 Richard Bruton II<br>## 03 Joan Burton II  |       |     |           |          | FF   |
| ## 03 Joan Burton Li   |       |     |           |          | FG   |
|  |       |     |           |          | LAB  |
| ## 04 Alchur Morgan  |       |     |           |          |      |
|  | ##    | 04  | ALUNUT    | morgan   | SF   |

```
05
           Brian
                                FF
                        Cowen
   06
            Enda
                        Kenny
                                FG
##
   07
          Kieran
                     ODonnell
                               FG
           Eamon
##
  0.8
                    Gilmore LAB
## 09
         Michael
                     Higgins
                              LAB
##
## Source: /home/paul/* on x86_64 by paul.
## Created: Wed Nov 28 16:49:22 2012.
## Notes: NA.
```

#### From a vector of texts

#### 3.2 Adding Information to a corpus

Adding new texts

Adding new text attributes

#### 3.3 Translating a quanteda corpus into other formats

**Importing from QDAMiner** 

Importing to and exporting from tm

- 4 Manipulating a corpus
- **5 Extracting Features**
- 6 Analyzing a document-feature matrix

#### References

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